



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,592	02/20/2004	Akio Atsuta	CFA00054US	1586

7590 04/19/2006
Canon U.S.A. Inc.
Intellectual Property Department
15975 Alton Parkway
Irvine, CA 92618-3731

EXAMINER

WYATT, KEVIN S

ART UNIT	PAPER NUMBER
----------	--------------

2878

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/783,592

Applicant(s)

ATSUTA ET AL.

Examiner

Kevin Wyatt

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 3, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Haas (U.S. Publication No. 20020000514 A1).

Regarding claim 3, Haas shows in Fig. 1A an optical encoder comprising: a scale having an optical grating; a plurality of photoreceptor elements that are movable relatively with respect to the scale and that are disposed in relation to a pitch of the optical grating (when the grid disk (2) is stationary, laser diodes (11) and (12) emit pulses at the same intensity, however, when grid disk is in motion one of the laser diodes is shadowed by grid disk (2) thus altering the light emitting position of the laser diodes); a light source (1, i.e., emission device) having at least two light portions (11 and 12, i.e., laser diodes) which irradiate the photoreceptor elements (elements within photo receiver (3)) through the scale (2, i.e., grid plate) from at least two different directions; and a controller (combination of control device (7) and evaluation circuit (4)) which changes the light-emitting intensity of the at least two light portions respectively (); wherein the controller obtains relative-position information of the scale and the photoreceptor elements based on the intensity of the light portions and signals obtained before and after the light-emitting intensity of the light portions is changed (since

Art Unit: 2878

evaluation circuit (4) determines speed and length of movement, if grid disk (2) is stationary, there is no modulation frequency when grid disk (2) is stationary which indicates no change in relative position) (paragraph 0027, lines 4-7 and paragraph 0029, lines 1-9).

Regarding claim 6, Haas shows in Fig. 1A an optical encoder comprising: a scale (2, i.e., grid plate) having an optical grating; a plurality of photoreceptor elements (elements within photo receiver (3)), each of which is positioned based on a pitch of the optical grating which is movable with respect to the photoreceptor elements; a first light source (11, i.e., laser diode) for providing light to the photoreceptor elements from a first direction: a second light source (12, i.e., laser diode) for providing light to the photoreceptor elements from a second direction; and a controller ((combination of control device (7) and evaluation circuit (4)) which controls the intensity of the light-emitting status of the first light source and the second light source, wherein the controller is capable of acquiring relative-position information between the scale (2, i.e., grid plate) and the photoreceptor elements (elements within photo receiver (3)) based on the intensity of the light emitting status and signals obtained from the plurality of photoreceptor elements before and after the intensity of the light-emitting status is controlled in a different status.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2878

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2 and 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Haas (U.S. Publication No. 20020000514 A1).

Regarding claims 1-2, Haas shows in Fig. 1A with regards to claim 1, an optical encoder comprising: a scale (2, i.e., grid plate) having an optical grating; a plurality of photoreceptor elements (elements within photo receiver (3)) that are movable relatively with respect to the scale and that are disposed in relation to a pitch of the optical grating; a light source (1, i.e., emission device) having at least two light portions which irradiate the photoreceptor elements through the scale from at least two different directions; and a controller (combination of control device (7) and evaluation circuit (4)) which selectively switches light-emitting status of the at least two light sources; wherein the controller (combination control device (7) and evaluation circuit (4)) obtains relative-position information of the scale and the photoreceptor elements based on the light-emitting status of the light source and signals obtained from the plurality of photoreceptor elements before and after when the light-emitting status of the light portions is switched. Haas shows in Fig. 1A with regards to claim 2, an optical encoder according to Claim 1, wherein a light-emitting position on the photoreceptor elements is changed when the light-emitting status of the light source is switched (paragraph 0028, lines 5-10). Haas does not disclose that the phase difference of the signals obtained from the photoreceptor elements before and after switching the light-emitting status is less than 90 degrees. However, Haas implies that structural changes such as providing light-emitting statuses of less than 90 degrees can be employed without departing from

the spirit of the invention. It would have been obvious to one skilled in the art to provide a light source obtaining light-emitting statuses of less than 90 degrees for the purpose of determining direction of motion at greater speed.

Regarding claim 4, Haas shows in Fig. 1A an optical encoder comprising: a scale (2, i.e., grid plate) having an optical grating: a plurality of photoreceptor elements (elements within photo receiver (3)) each of which is positioned based on a pitch of the optical grating which is movable with respect to the photoreceptor elements; a first light source (11, i.e., laser diode) for providing light to the photoreceptor elements from a first direction: a second light source (11, i.e., laser diode) for providing light to the photoreceptor elements from a second direction; and a controller ((combination of control device (7) and evaluation circuit (4)) which switches the light-emitting status of the first light source and the second light source, wherein the controller is capable of acquiring relative-position information between the scale and the photoreceptor elements (elements within photo receiver (3)) based on the light emitting status and controlled in a different status. and signals obtained from the plurality of photoreceptor elements before and after the light-emitting status of the light portions is controlled in a different status, and wherein phase difference of the signals obtained from the photoreceptor elements before and after switching the light-emitting status is less than 90 degrees. However, Haas implies that structural changes such as providing light-emitting statuses of less than 90 degrees can be employed without departing from the spirit of the invention. It would have been obvious to one skilled in the art to provide a light source obtaining light-emitting statuses of less than 90 degrees for the purpose of

determining direction of motion at greater speed.

Response to Arguments

5. Applicant's arguments filed on 1/20/2006 have been fully considered but they are not persuasive.

In response to applicant's argument that Haas uses a plurality of light-emitting elements while switching them instead of providing a plurality of sensors, the examiner disagrees. The plurality of sensors are comprised within the photo receiver (3).

In response to applicant's arguments that Haas does not teach phase difference of signals obtained from the photoreceptor elements before and after switching the light-emitting status is less than 90 degrees, the examiner disagrees. According to paragraph 0017, the described invention is limited to the details shown in the described embodiments. Therefore Haas implies that structural changes such as providing light-emitting statuses of less than 90 degrees can be employed without departing from the spirit of the invention.

Therefore Haas discloses all of the limitations of independent claims 1 and 4 and therefore the rejection of these claims are proper. In addition, the rejection of claim 2 which is depends upon claim 1, is also proper.

In response to applicant's argument that Haas does not teach the controller obtains relative-position information of the scale and the photoreceptor elements based on the intensity of the light portions and signals obtained before and after the light-emitting intensity of the light portions is changed. The examiner disagrees. The

Art Unit: 2878

evaluation portion of the (combination of control device (7) and evaluation circuit (4)) obtains the position information based on the intensity of the light portions. Information concerning intensity, direction and position of the light source (1) relative to the scale is determined by the speed and frequency (or duty cycle) at which laser diodes (11) and (12) are individually pulsed. Therefore Haas discloses all of the limitations of independent claim 3 and therefore the rejection of these claim is proper.

In response to applicant's argument that Haas does not teach the controller is capable of acquiring relative-position information between the scale and the photoreceptor elements based on the intensity of the light emitting status and signals obtained from the plurality of photoreceptor elements before and after the intensity of the light-emitting status is controlled in a different status, the examiner disagrees. The controller (combination control device (7) and evaluation circuit (4)) of Haas obtains its relative-position information using the evaluation circuit (4) which is responsible for deducing direction of movement, speed and length of movement detected from the rate of change intensity of the light emitters (paragraph 0029, lines 6-11). Therefore Haas discloses all of the limitations of independent claim 6 and therefore the rejection of these claims is proper.

Therefore Haas discloses all of the limitations of independent claim 6 and therefore the rejection of this claim is proper.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

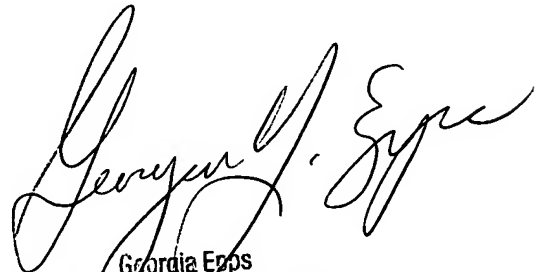
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571)-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



K.W.



Georgia Epps
Supervisory Patent Examiner
Technology Center 2800